

**Example 30**

2-(4-Undecylphenyl)pyrimidin-2-yl 5-pentylthiophene-2-carboxylate

Phase sequence X 86 S<sub>A</sub> 91 N 111 I5 **Example 31**

4-(2-Fluoro-4-undecylphenyl)phenyl 5-pentylthiophene-2-carboxylate

Phase sequence X 41 N 79 I

**Example 32**

10 4-(5-undecylpyridin-2-yl)-2-fluorophenyl 5-pentylthiophene-2-carboxylate

Phase sequence X 74 N 89 I

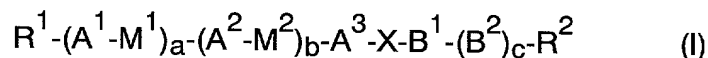
**Example 33**

4-(5-Undecylpyridin-2-yl)phenyl 5-pentylthiophene-2-carboxylate

15 Phase sequence X 61 S<sub>2</sub> 65 S<sub>C</sub> 89 N 112 I

# Patent claims

1. An active-matrix display containing a chiral smectic liquid-crystal mixture, wherein the liquid-crystal mixture comprises at least one compound of the formula (I)



where the symbols are as defined below:

$R^1$ ,  $R^2$  are, independently of one another, identical or different and are each

- a) hydrogen, fluorine or CN  
a straight-chain or branched alkenyl, alkenyloxy, alkyl or alkyloxy radical (with or without asymmetric carbon atoms) having 2 to 16 carbon atoms, where

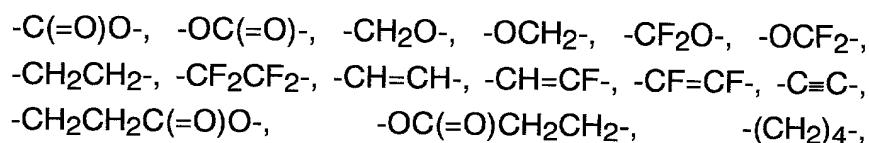
- b1) one or two nonterminal  $-CH_2-$  groups may be replaced by  $-O-$ ,  $-OC(=O)-$ ,  $-(C=O)-$ ,  $-C(=O)O-$ ,  $-Si(CH_3)_2-$ ,  $-CH(Cl)-$  and/or one or two  $-CH_2-$  groups may be replaced by  $-CH=CH-$  or  $-C\equiv C-$

and one or more H atoms may be replaced by F and/or

- b2) one or more  $-CH_2-$  groups may be replaced by phenylene-1,4-diyl (unsubstituted, monosubstituted or disubstituted by F), phenylene-1,3-diyl (unsubstituted, monosubstituted or disubstituted by F), cyclohexane-1,4-diyl (unsubstituted or monosubstituted by F or CN) or cyclopropane-1,2-diyl

and one or more H atoms may be replaced by F with the provisos that only one of the radicals  $R^1$ ,  $R^2$  can be hydrogen, F or CN and that two adjacent  $-CH_2-$  groups cannot be replaced by  $-O-$

$M^1$ ,  $M^2$  are, independently of one another, identical or different and are each



-OCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>O-, -OCH<sub>2</sub>CF<sub>2</sub>CH<sub>2</sub>,  
 -CH<sub>2</sub>CF<sub>2</sub>CH<sub>2</sub>O- or a single bond

A<sup>1</sup>, A<sup>2</sup>, A<sup>3</sup> are, independently of one another, identical or different  
 and are each cyclohexane-1,4-diyl (unsubstituted or mono-  
 substituted by F, CH<sub>3</sub>, CN), cyclohex-1-ene-1,4-diyl, cyclo-  
 hex-2-ene-1,4-diyl, 2-oxocyclohexane-1,4-diyl, 2-cyclohexen-  
 1-one-3,6-diyl, 1-alkyl-1-silacyclohexane-1,4-diyl, bicyclo-  
 [2.2.2]octane-1,4-diyl, spiro[4.5]decane-2,8-diyl, spiro[5.5]-  
 undecane-3,9-diyl, phenylene-1,4-diyl (unsubstituted, mono-  
 substituted or disubstituted by CN, CH<sub>3</sub>, CF<sub>3</sub>, OCH<sub>3</sub>,  
 unsubstituted, monosubstituted, disubstituted, trisubstituted or  
 tetrasubstituted by F), phenylene-1,3-diyl (unsubstituted,  
 monosubstituted or disubstituted by CN, CH<sub>3</sub>, CF<sub>3</sub>, OCF<sub>3</sub>,  
 unsubstituted, monosubstituted, disubstituted, trisubstituted or  
 tetrasubstituted by F), thiophene-2,5-diyl, thiophene-2,4-diyl,  
 (1,3,4)-oxadiazole-2,5-diyl, (1,3,4)-thiadiazole-2,5-diyl,  
 1,3-thiazole-2,5-diyl, 1,3-thiazole-2,4-diyl, (1,3)-oxazole-  
 2,5-diyl, isoxazole-2,5-diyl, indane-2,6-diyl, naphthalene-  
 2,6-diyl (unsubstituted, monosubstituted or disubstituted by F  
 or CN), 1,2,3,4-tetrahydronaphthalene-2,6-diyl, decaline-  
 2,6-diyl, pyrimidine-2,5-diyl (unsubstituted or monosubstituted  
 by F), pyridine-2,5-diyl (unsubstituted, monosubstituted or  
 disubstituted by F), pyrazine-2,5-diyl (unsubstituted or mono-  
 substituted by F), pyridazine-3,6-diyl, quinoline-2,6-diyl,  
 quinoline-3,7-diyl, isoquinoline-3,7-diyl, quinazoline-2,6-diyl,  
 5,6,7,8-tetrahydroquinazoline-2,6-diyl, quinoxaline-2,6-diyl,  
 1,3-dioxane-2,5-diyl (unsubstituted or monosubstituted by  
 CN), benzothiazole-2,6-diyl, piperidine-2,4-diyl, piperazine-  
 1,4-diyl

B<sup>1</sup> is cyclohexane-1,4-diyl (unsubstituted, monosubstituted or  
 disubstituted by F, CH<sub>3</sub>, CN), perfluorocyclohexane-1,4-diyl,  
 cyclohex-1-ene-1,4-diyl, cyclohex-2-ene-1,4-diyl, 1-alkyl-1-sila-  
 cyclohexane-1,4-diyl, bicyclo[2.2.2]octane-1,4-diyl, cyclo-  
 pentane-1,3-diyl, cycloheptane-1,4-diyl, tetrahydrofuran-  
 2,5-diyl, tetrahydrofuran-2,4-diyl, phenylene-1,4-diyl (unsub-  
 stituted, monosubstituted or disubstituted by CN, CH<sub>3</sub>, CF<sub>3</sub>,  
 OCF<sub>3</sub>, unsubstituted, monosubstituted, disubstituted, tri-